



# SPEC® CFP2006 Result

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## IBM Corporation

### SPECfp®\_rate2006 = 41.1

### IBM System x3200 M2 (Intel Xeon X3320)

### SPECfp\_rate\_base2006 = 38.7

CPU2006 license: 11

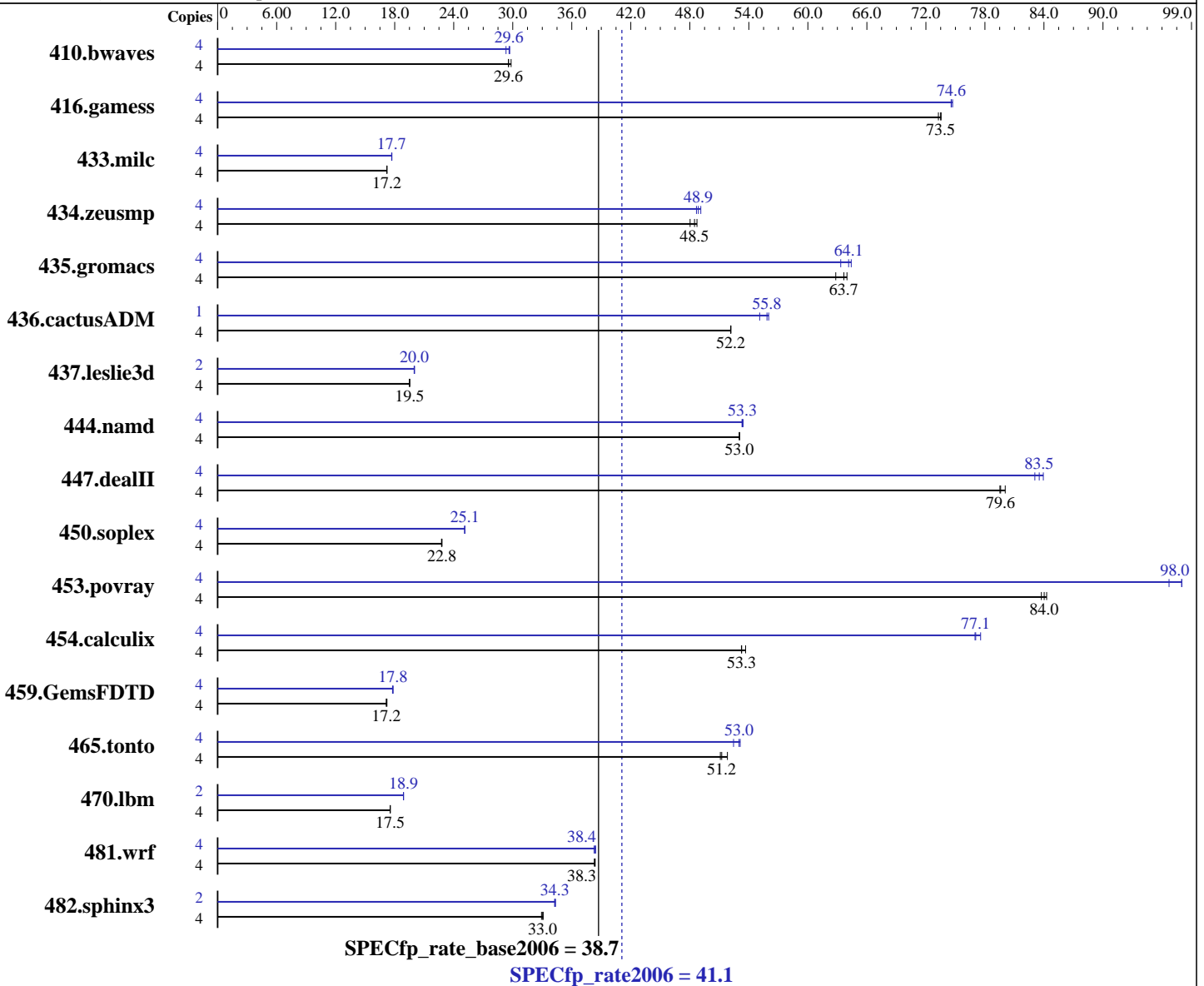
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Jan-2008

Hardware Availability: Apr-2008

Software Availability: Nov-2007



#### Hardware

CPU Name: Intel Xeon X3320  
 CPU Characteristics: 1333MHz system bus  
 CPU MHz: 2500  
 FPU: Integrated  
 CPU(s) enabled: 4 cores, 1 chip, 4 cores/chip  
 CPU(s) orderable: 1 chip  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 6 MB I+D on chip per chip, 3 MB shared / 2 cores

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#### Software

Operating System: SuSE Linux Enterprise Server 10 (x86\_64) SP1, Kernel 2.6.16.46-0.12-smp  
 Compiler: Intel C++ and Fortran Compiler 10.1 for Linux Build 20070913 Package ID: l\_cc\_p\_10.1.008, l\_fc\_p\_10.1.008  
 Auto Parallel: Yes  
 File System: ReiserFS  
 System State: Multi-user, run level 3  
 Base Pointers: 64-bit

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L3 Cache: None  
Other Cache: None  
Memory: 8 GB (4 x 2 GB DDR2-5300 ECC)  
Disk Subsystem: 1 x 146 GB SAS, 15000 RPM  
Other Hardware: None

Peak Pointers: 32/64-bit  
Other Software: Binutils 2.17.50.0.15

### Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	4	1822	29.8	<b>1838</b>	<b>29.6</b>	1839	29.6	4	1831	29.7	<b>1835</b>	<b>29.6</b>	1854	29.3
416.gamess	4	1069	73.3	1065	73.5	<b>1066</b>	<b>73.5</b>	4	1050	74.6	1048	74.7	<b>1050</b>	<b>74.6</b>
433.milc	4	2134	17.2	2134	17.2	<b>2134</b>	<b>17.2</b>	4	2073	17.7	<b>2075</b>	<b>17.7</b>	2076	17.7
434.zeusmp	4	758	48.0	747	48.7	<b>751</b>	<b>48.5</b>	4	<b>745</b>	<b>48.9</b>	748	48.7	741	49.1
435.gromacs	4	455	62.8	446	64.0	<b>449</b>	<b>63.7</b>	4	443	64.4	<b>445</b>	<b>64.1</b>	451	63.3
436.cactusADM	4	<b>916</b>	<b>52.2</b>	917	52.1	916	52.2	1	213	56.0	<b>214</b>	<b>55.8</b>	217	55.1
437.leslie3d	4	1925	19.5	1929	19.5	<b>1926</b>	<b>19.5</b>	2	939	20.0	<b>940</b>	<b>20.0</b>	941	20.0
444.namd	4	<b>605</b>	<b>53.0</b>	605	53.0	605	53.1	4	<b>601</b>	<b>53.3</b>	602	53.3	601	53.4
447.dealII	4	572	80.1	<b>575</b>	<b>79.6</b>	575	79.5	4	<b>548</b>	<b>83.5</b>	551	83.1	545	83.9
450.soplex	4	1462	22.8	<b>1464</b>	<b>22.8</b>	1466	22.8	4	<b>1328</b>	<b>25.1</b>	1327	25.1	1329	25.1
453.povray	4	254	83.7	<b>253</b>	<b>84.0</b>	253	84.3	4	<b>217</b>	<b>98.0</b>	220	96.7	217	98.0
454.calculix	4	<b>619</b>	<b>53.3</b>	620	53.2	615	53.7	4	425	77.6	<b>428</b>	<b>77.1</b>	429	77.0
459.GemsFDTD	4	2474	17.2	2466	17.2	<b>2474</b>	<b>17.2</b>	4	2380	17.8	<b>2381</b>	<b>17.8</b>	2387	17.8
465.tonto	4	770	51.1	760	51.8	<b>768</b>	<b>51.2</b>	4	741	53.1	751	52.4	<b>743</b>	<b>53.0</b>
470.lbm	4	3133	17.5	3132	17.5	<b>3133</b>	<b>17.5</b>	2	1455	18.9	<b>1455</b>	<b>18.9</b>	1454	18.9
481.wrf	4	1164	38.4	<b>1165</b>	<b>38.3</b>	1167	38.3	4	1163	38.4	1167	38.3	<b>1164</b>	<b>38.4</b>
482.sphinx3	4	2356	33.1	<b>2360</b>	<b>33.0</b>	2368	32.9	2	<b>1137</b>	<b>34.3</b>	1138	34.3	1135	34.4

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

### General Notes

All benchmarks compiled in 64-bit mode except 437.leslie3d, 450.soplex, 470.lbm and 482.sphinx3, at peak, are compiled in 32-bit mode  
OMP\_NUM\_THREADS set to number of cores  
KMP\_AFFINITY set to physical,0  
KMP\_STACKSIZE set to 64M  
taskset utility used to bind CPU(s) to processes

### Base Compiler Invocation

C benchmarks:  
icc

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## Base Compiler Invocation (Continued)

C++ benchmarks:  
icpc

Fortran benchmarks:  
ifort

Benchmarks using both Fortran and C:  
icc ifort

## Base Portability Flags

410.bwaves: -DSPEC\_CPU\_LP64  
416.gamess: -DSPEC\_CPU\_LP64  
433.milc: -DSPEC\_CPU\_LP64  
434.zeusmp: -DSPEC\_CPU\_LP64  
435.gromacs: -DSPEC\_CPU\_LP64 -nofor\_main  
436.cactusADM: -DSPEC\_CPU\_LP64 -nofor\_main  
437.leslie3d: -DSPEC\_CPU\_LP64  
444.namd: -DSPEC\_CPU\_LP64  
447.dealII: -DSPEC\_CPU\_LP64  
450.soplex: -DSPEC\_CPU\_LP64  
453.povray: -DSPEC\_CPU\_LP64  
454.calculix: -DSPEC\_CPU\_LP64 -nofor\_main  
459.GemsFDTD: -DSPEC\_CPU\_LP64  
465.tonto: -DSPEC\_CPU\_LP64  
470.lbm: -DSPEC\_CPU\_LP64  
481.wrf: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_CASE\_FLAG -DSPEC\_CPU\_LINUX  
482.sphinx3: -DSPEC\_CPU\_LP64

## Base Optimization Flags

C benchmarks:  
-fast

C++ benchmarks:  
-fast

Fortran benchmarks:  
-fast

Benchmarks using both Fortran and C:  
-fast



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## Peak Compiler Invocation

C benchmarks (except as noted below):

```
/opt/intel/cc/10.1.008/bin/icc -L/opt/intel/cc/10.1.008/lib
-I/opt/intel/cc/10.1.008/include
```

433.milc: icc

C++ benchmarks (except as noted below):

icpc

```
450.soplex: /opt/intel/cc/10.1.008/bin/icpc -L/opt/intel/cc/10.1.008/lib
-I/opt/intel/cc/10.1.008/include
```

Fortran benchmarks (except as noted below):

ifort

```
437.leslie3d: /opt/intel/fc/10.1.008/bin/ifort -L/opt/intel/fc/10.1.008/lib
-I/opt/intel/fc/10.1.008/include
```

Benchmarks using both Fortran and C:

icc ifort

## Peak Portability Flags

```
410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64 -nofor_main
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
444.namd: -DSPEC_CPU_LP64
447.deall: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64 -nofor_main
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
```

## Peak Optimization Flags

C benchmarks:

```
433.milc: -prof-gen(pass 1) -prof-use(pass 2) -fast -fno-alias
-auto-ilp32
```

```
470.lbm: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll2
-scalar-rep- -prefetch -opt-malloc-options=3
```

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## Peak Optimization Flags (Continued)

482.sphinx3: -fast -unroll2

### C++ benchmarks:

444.namd: -prof-gen(pass 1) -prof-use(pass 2) -fast -fno-alias  
-auto-ilp32

447.dealIII: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll2  
-ansi-alias -scalar-rep-

450.soplex: -prof-gen(pass 1) -prof-use(pass 2) -fast  
-opt-malloc-options=3

453.povray: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll4  
-ansi-alias

### Fortran benchmarks:

410.bwaves: -fast -prefetch

416.gamess: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll2 -Ob0  
-ansi-alias -scalar-rep-

434.zeusmp: -prof-gen(pass 1) -prof-use(pass 2) -fast

437.leslie3d: -prof-gen(pass 1) -prof-use(pass 2) -fast -prefetch  
-opt-malloc-options=3

459.GemsFDTD: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll2 -Ob0  
-prefetch

465.tonto: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll4 -auto

### Benchmarks using both Fortran and C:

435.gromacs: -prof-gen(pass 1) -prof-use(pass 2) -fast -prefetch  
-auto-ilp32

436.cactusADM: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll2  
-prefetch -parallel -auto-ilp32

454.calculix: -fast -unroll-aggressive -auto-ilp32

481.wrf: -fast -auto-ilp32

The flags file that was used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/Intel-ic10.1-FP-intel64-linux-flags.20090713.html>



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You can also download the XML flags source by saving the following link:

<http://www.spec.org/cpu2006/flags/Intel-ic10.1-FP-intel64-linux-flags.20090713.xml>

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